EUROPEAN MICROWAVE ASSOCIATION

Outstanding Career Award

Professor Bumman Kim is one of the giants of the microwave domain, who has made large and lasting contributions to microwave power amplifiers. Prof. Kim entirely restructured the Doherty amplifier configuration and created the modern Doherty configuration in 2000, often referred to as the offset line technique. The Doherty concept was already invented using vacuum tubes in 1936, but not applicable to microwave amplification because of its low efficiency at high frequencies and its relatively poor linearity. He pioneered the linear power operation of the modern microwave Doherty amplifiers, later adopted in the vast majority of base-station microwave amplifiers. Earlier in his career, Prof. Kim already proposed and demonstrated the first microwave power amplification utilizing heterojunction bipolar transistor (HBT); nowadays, the HBT is the most popular device for microwave power amplifiers of mobile handsets. In addition, he demonstrated the first fully-integrated MMIC operation at mm-wave frequencies in 1984 and the first semiconductor-based oscillator operation over 100 GHz, making significant advancement of the MMIC technology toward mm-wave applications

As the 5G mobile communication system emerged in the early 2010's, his group developed a highly efficient linear power amplifier at Ka-band using 28-nm bulk CMOS technology, leveraging his earlier work on GaAs and CMOS PAs. The deep class-AB biased CMOS PA with appropriate harmonic control circuits provided a linear operation close to the saturated power realizing high efficiency and high linearity. This CMOS power amplifier delivered the performance required by the 5G system specification for the first time.

Prof. Kim holds a B.Sc. from Seoul National University, an M.Sc. from the University of Texas at Austin, and a Ph.D. in Electrical Engineering from Carnegie Mellon University, Pittsburgh, PA. He worked in industrial roles, for Texas Instruments as Senior Member of Technical Staff and POSTECH at Korea as a professor, a position which lasted 28 years, supervising 58 Ph.D. students.
His efforts in mentoring students and young engineers are widely praised. Apart from his

employment record, he was active in the Korean academic institutions, notably in the Korean Academy of Science and Technology and in the National Academy of Engineering of Korea, and the international microwave scene, including the Adcom of MTT society, the EuMA General Assembly, and the APMC Assembly.

His career spans four decades of outstanding achievements on the intersection between microwave technology and microwave applications. His contributions to microwave power amplifiers have changed the course of technology, and were clearly not lucky shots, as they were successively based on different circuit concepts and involving multiple technologies, showing time and time again the road ahead to the entire community.